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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/535,487
Filing Date: May 17, 2005
Appellants: MONAGHAN ET AL.

Charles Rodman
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 20 September 2010 appealing from the Office Action mailed 8 July 2010.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

US 2,717,867 JEWELL et al. 09-1955

(9) Grounds of Rejection

The following grounds of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office Action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 2-17 and 19-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Jewell (2,717,867).

3. With respect to claim 26, Jewell discloses a process for converting a liquid feed material into a vapor phase product comprising: (a) providing a fluid bed (21) comprising solid particles and a fluidizing medium (supplied via aeration supply lines (22, 23)), wherein the fluidizing medium is moving in a substantially vertical fluidizing direction (see Jewell, Fig. 1 and Fig. 2) and wherein the solid particles are at a conversion temperature which is suitable for facilitating the conversion of the liquid feed material to the vapor phase product (see Jewell, column 2, lines 45-51; and column 3, lines 35-41 and 58-63); (b) moving the solid particles in a substantially horizontal solid transport direction from an upstream horizontal position to a downstream horizontal position (see Jewell, Fig. 1 and Fig. 2; and column 5, lines 43-53); (c) introducing the liquid feed

material (supplied via process line (17)) directly[1] to the fluid bed (21) at a feed zone located between the upstream horizontal position and the downstream horizontal position in order to facilitate the conversion of the liquid feed material into the vapor phase product (see Jewell, Fig. 1 and Fig. 2); (d) maintaining the solid particles as fluidized solid particles in the feed zone by introducing the fluidizing medium to the fluid bed in the feed zone (see Jewell, column 3, lines 11-21); and (e) collecting the vapor phase product (via product outlet lines (49)).

4. With respect to claim 2, Jewell discloses wherein the solid particles are collected (in passageway (32)).

5. With respect to claim 3, Jewell discloses wherein the step of providing the fluid bed comprises introducing the solid particles at the upstream horizontal position and wherein the step of collecting the solid particles comprises collecting the solid particles at the downstream horizontal position (see Jewell, Fig. 1 and Fig. 2).

6. With respect to claim 4, Jewell discloses a step of regenerating the solid particles for re-use after collecting the solid particles (see Jewell, column 6, lines 68-75; column 7, lines 1-4; and Fig. 1).

7. With respect to claims 5 and 6, Jewell discloses wherein the step of regenerating the solid particles is comprised of heating the solid particles to the conversion temperature (see Jewell, column 7, lines 5-34; and Example).

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[1] Jewell clearly discloses that a portion of the oil coming into contact with the solid particles remains "unvaporized" (see Jewell, column 3, lines 70-72). Jewell explains that *"the unvaporized portion is absorbed by the coke which is [then] settled onto the upper surface of the fluid bed of coke distribution plate 20"* (see Jewell, column 3, lines 70-74) (emphasis added). Thus, Jewell provides clear disclosure for "introducing the *liquid* feed material *directly* to the fluid bed."

8. With respect to claims 7 and 8, Jewell discloses wherein the upstream horizontal position is at a higher elevation than the downstream horizontal position so that the solid particles move in the solid transport direction from the upstream horizontal position to the downstream horizontal position under the influence of gravity (see Jewell, Fig. 1 and Fig. 2).

9. With respect to claim 9, Jewell discloses wherein the step of providing the fluid bed is comprised of introducing the fluidizing medium at a lower vertical position below the solid particles so that the fluidizing direction is substantially upward (see Jewell, Fig. 1 and Fig. 2).

10. With respect to claims 10-14, Jewell discloses wherein the step of introducing the liquid feed material to the fluid bed at the feed zone is comprised of spraying the liquid feed material so that the liquid feed material contacts the solid particles as droplets; wherein the liquid feed is sprayed within the fluid bed so that the droplets penetrate the fluid bed; wherein the liquid feed material is sprayed so that the droplets contact the solid particles from a spraying direction which is substantially perpendicular to the solid transport direction; wherein the spraying direction is a substantially vertical direction; and wherein the spraying direction is substantially opposite to the fluidizing direction (see Jewell, column 3, line 75; column 4, lines 1-47; and Fig. 1 and Fig. 2).

11. With respect to claim 15, Jewell discloses a step of quenching the vapor phase product after collecting the vapor phase product in order to minimize further conversion of the vapor phase product (see Jewell, column 9, lines 17-29).

12. With respect to claims 16 and 17, Jewell discloses collecting the fluidizing medium with the vapor phase product at an upper vertical position (e.g., through outlet lines (49)) above the solid particles (see Jewell, Fig. 2 and accompanying text); and separating the fluidizing medium and the vapor phase product after collecting the fluidizing medium and the vapor phase product (see Jewell, column 9, lines 50-53).

13. With respect to claims 19-21, Jewell discloses wherein the liquid feed material is comprised of liquid hydrocarbon; heavy hydrocarbon; or heavy oil or a heavy fraction of a crude oil (see Jewell, column 1, lines 15-30).

14. With respect to claim 22, the hot coke particles of Jewell act as a catalyst in the coking reaction and conversion of the liquid feed material into vapor phase product (see Jewell, column 1, lines 46-49; and column 5, lines 14-24 and 36-40).

15. With respect to claim 23, Jewell discloses wherein the step of collecting the vapor phase product is comprised of collecting the vapor phase product at a plurality of vapor phase product collection locations (49) spaced horizontally between the upstream horizontal position and the downstream horizontal position (see Jewell, Fig. 2 with accompanying text).

16. With respect to claim 24, Jewell does not explicitly disclose wherein the composition of the vapor phase product varies amongst the vapor phase collection locations.

However, Jewell discloses four vapor phase collection locations (49) spaced along the entire length of the drum (19) (see Jewell, Fig. 2). In such an apparatus, the vapor phase product removed from the first vapor phase collection location (49) nearest

the upstream end of the drum (19) would *necessarily* be different in composition than the vapor phase product removed from the fourth vapor phase collection location (49) nearest the downstream end of the drum (19) given the difference in residence time of the coke particles (21) directly beneath the fourth vapor phase collection location (49).

Thus, Jewell provides inherent disclosure for "the composition of the vapor phase product [varying] amongst the vapor phase collection locations."

17. With respect to claim 25, Jewell discloses a step of collecting a vaporized fraction of the liquid fraction of the liquid feed material at a vapor phase product collection location which is adjacent to the feed zone (in vapor product outlet lines (49)) (see Jewell, Fig. 1 and Fig. 2).

Claim Rejections - 35 USC § 103

18. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

19. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

20. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

21. Claims 18 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jewell (US 2,717,867).

22. With respect to claim 18, see discussion *supra* at paragraph 3.

Jewell does not explicitly disclose wherein the solid particles are moved in the solid transport direction at a rate which is significantly larger than a rate of mixing of the solid particles in the solid transport direction.

With respect to claim 18, Jewell discloses wherein the residence time of the solid particles in the horizontally elongated drum (19) can be *varied* by *adjusting* the rate at which the solid particles are discharged into the drum and by *adjusting* the quantity of solid particles in the drum (see Jewell, column 5, lines 43-67).

Therefore, Examiner finds Applicant's claim 18 unpatentable in view of Jewell, given Jewell's disclosure that the rate of lateral flow of the solid particles can be freely adjusted as desired.

23. With respect to claim 24, see discussion *supra* at paragraph 15.

Jewell does not explicitly disclose wherein the composition of the vapor phase product varies amongst the vapor phase collection locations.

However, Jewell discloses four vapor phase collection locations (49) spaced along the entire length of the drum (19) (see Jewell, Fig. 2). In such an apparatus, the person having ordinary skill in the art would reasonably expect that the vapor phase product removed from the first vapor phase collection location (49) nearest the upstream end of the drum (19) would be different in composition than the vapor phase product removed from the fourth vapor phase collection location (49) nearest the downstream end of the drum (19) given the difference in residence time of the coke particles (21) directly beneath the fourth vapor phase collection location (49). In this regard, Examiner notes that in considering the disclosure of a reference, it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom. See MPEP § 2144.01 (quoting *In re Preda*, 401 F.2d 825, 826 (CCPA 1968)).

Therefore, Examiner finds Applicant's claim 24 unpatentable in view of Jewell's implicit disclosure for "the composition of the vapor phase product [varying] amongst the vapor phase collection locations."

(10) Response to Argument

Appellant's Arguments at page 15

Appellant argues at page 15 of the brief that, with respect to claim 26, Jewell discloses the liquid feed material being introduced "indirectly" to the fluid bed rather than "directly."

In response to Appellant's argument, Examiner notes wherein Jewell clearly discloses that a portion of the oil coming into contact with the solid particles remains "unvaporized" (see Jewell, column 3, lines 70-72). Jewell explains that *"the unvaporized portion is absorbed by the coke which is [then] settled onto the upper surface of the fluid bed of coke distribution plate 20"* (see Jewell, column 3, lines 70-74) (emphasis added). Thus, Jewell provides clear disclosure for "introducing the *liquid* feed material *directly* to the fluid bed."

Appellant's Arguments at pages 15 and 16

Appellant argues at pages 15 and 16 of the brief that, with respect to claim 26, that Jewell does not disclose or describe introducing the liquid feed material "separately from the solid particles" since the unvaporized portion of the liquid feed material is introduced to the fluid bed together with the hot coke particles.

In response to Appellant's argument, Figure 3 of Jewell shows an entry (28) for hot coke particles being *separate* from residual oil line (17) and spray head (25) through which oil enters the drum (19). Furthermore, Jewell explains that the ratio in which coke and oil may be charged to the drum (19) is affected by the volatility of the oil, and such ratio may be controlled within limits by varying the temperature of the coke (see Jewell,

column 3, lines 48-52). Jewell notes that in some circumstances unabsorbed oil may fall on the bed of coke (see Jewell, column 3, lines 58-63) (*"[T]he temperatures of the hot coke and oil charged into drum [19] and the relative proportions of each are controlled to effect rapid vaporization of the oil and absorption of the unvaporized constituents, whereby little [ ] liquid oil falls on the upper surface of the fluid bed of coke."*). Thus, Jewell does *not* support the view that 100% of the oil is necessarily absorbed by the hot coke particles being introduced into drum (19) such that absolutely no unabsorbed oil falls to the fluidized bed separately from the coke particles.

Appellant's Arguments at page 17

Appellant argues at page 17 of the brief, with respect to claim 26, that since the hot coke particles are introduced together with the unvaporized portion of the liquid feed material, the solid particles cannot be introduced to the fluid bed at the upstream horizontal position while the liquid feed material is simultaneously introduced to the fluid bed at a feed zone which is between the upstream horizontal position and the downstream horizontal position.

In response to Appellant's argument, such argument is directed to the claim limitations "wherein providing the fluid bed is comprised of introducing the solid particles to the fluid bed at an upstream horizontal position in the fluid bed" and "introducing the liquid feed material . . . at a feed zone located between the upstream horizontal position and the downstream horizontal position."

With respect to the first quoted claim limitation, and with reference to Figure 2 of Jewell, Jewell discloses delivery of hot coke particles through branch lines (28) and into

drum (19). The hot coke particles fall onto the fluidized bed of coke (21) which occupies substantially all of the bottom portion of drum (19) (see Jewell, Fig. 2). Since Jewell discloses coke discharge through passageway (32) (see Jewell, column 6, lines 30-32), it is clear that the fluidized bed moves in "a substantially horizontal transport position" from right to left. In such case, the right-most portion of the fluidized bed (21) occupying the bottom of drum (19) is properly called an "upstream horizontal position" while that portion of drum (19) through which the hot coke particles are discharged through passageway (32) is properly called a "downstream horizontal position." Thus, Jewell discloses "wherein providing the fluid bed is comprised of introducing the solid particles to the fluid bed at an upstream horizontal position in the fluid bed."

With respect to the second quoted limitation, and again with reference to Figure 2 of Jewell, Jewell discloses the input of hot residual oil through line (17) into the vaporizing section defined by partition (24) of drum (19). It is clear from Jewell's Figure 2 that the point of oil input into drum (19) is at "a feed zone located between the upstream horizontal position and the downstream horizontal position" (see Jewell, Fig. 2) (showing a portion of fluidized bed (21) extending to the right of the oil input location – i.e. *"upstream"* from where oil is input into drum (19)). In this regard, Examiner again notes that Jewell does *not* support the view that 100% of the oil is necessarily absorbed by the hot coke particles being introduced into drum (19) such that absolutely no unabsorbed oil falls to the fluidized bed separately from the coke particles.

Appellant's Arguments at page 19

Appellant argues at page 19 of the brief, with respect to claims 10-14, that: (1) Jewell does not spray the liquid feed oil directly into the fluid bed, but rather sprays the liquid feed oil onto the solid coke particles above the fluid bed, prior to introduction to the fluid bed; and (2) the tangential lines (30) introduce an extraneous gas into the mixing section, which produces a swirling movement of the coke particles and oil droplets, further inhibiting or preventing the oil droplets from being introduced directly to the fluid bed.

In response to Appellant's arguments, Examiner notes wherein Jewell clearly discloses that a portion of the oil coming into contact with the solid particles remains "unvaporized" (see Jewell, column 3, lines 70-72). Jewell explains that *"the unvaporized portion is absorbed by the coke which is [then] settled onto the upper surface of the fluid bed of coke distribution plate 20"* (see Jewell, column 3, lines 70-74) (emphasis added). Thus, Jewell provides clear disclosure for "introducing the *liquid* feed material *directly* to the fluid bed." While it is true that in a *preferred* embodiment, Jewell discloses rapid vaporization of the liquid feed oil and absorption of the unvaporized constituents (see Jewell, column 3, lines 58-61), Jewell also discloses that in some instances unabsorbed liquid feed oil may fall on the surface of the fluid bed of coke (see Jewell, column 3, lines 58-63) (*"[T]he temperatures of the hot coke and oil charged into drum [19] and the relative proportions of each are controlled to effect rapid vaporization of the oil and absorption of the unvaporized constituents, whereby little [ ] liquid oil falls on the upper surface of the fluid bed of coke."*). Thus, Jewell does *not*

support the view that 100% of the oil is necessarily absorbed by the hot coke particles being introduced into drum (19) such that absolutely no unabsorbed oil falls to the fluidized bed separately from the coke particles.

Appellant's Arguments at page 21

Appellant argues at page 21 of the brief, with respect to claim 18, that Jewell does not Jewell does not disclose, describe, or suggest "wherein the solid particles are moved in a solid transport direction at a rate significantly larger than a rate of mixing of the solid particles in the solid transport direction."

In response to Appellant's argument, Examiner first notes that claim 18 was rejected under 35 U.S.C. 103(a) as being unpatentable over Jewell and not under 35 U.S.C. 102(b) as being anticipated by Jewell.

With respect to claim 18, Jewell discloses wherein the residence time of the solid particles in the horizontally elongated drum (19) can be *varied* by *adjusting* the rate at which the solid particles are discharged into the drum and by *adjusting* the quantity of solid particles in the drum (see Jewell, column 5, lines 43-67).

Therefore, Examiner finds Applicant's claim 18 unpatentable in view of Jewell, given Jewell's disclosure that the rate of lateral flow of the solid particles can be freely *adjusted* as *desired*.

Appellant's Arguments at page 22

Appellant argues at page 22 of the brief, with respect to claim 22, that Jewell does not discuss in any manner the solid particles being comprised of a catalyst.

In response to Appellant's argument, Examiner notes wherein the instant specification provides that "[t]he solid particles (28) may optionally also provide a catalytic function for facilitating or enhancing the conversion reactions which occur in the reactor" (see specification, page 14, lines 24-25).

Examiner submits that the solid coke particles of Jewell provide such a "catalytic function" consistent with Appellant's claim 22 when viewed in light of the specification. Specifically, Jewell explains that "[t]he coke particles, on which residual components of the oil are undergoing further distillation and *decomposition*, are precipitated onto the fluidized bed of coke whose upper level is indicated at 21" (see Jewell, column 5, lines 21-24) (emphasis added) and "[t]he time of residence of the coke particles in the fluid bed in drum 19 is sufficient to provide the soaking time required to complete the *coking* of the residual hydrocarbons deposited on the coke particles and the *evolution of hydrocarbons* released by the coking *reaction*" (see Jewell, column 5, lines 36-40) (emphases added). Examiner submits that the quoted passages from Jewell clearly evidence that the hot coke particles "provide a catalytic function for facilitating or enhancing the conversion reactions which occur in the reactor."

Appellant's Arguments at page 23

Appellant argues at page 23 of the brief, with respect to claim 25, that Jewell does not disclose or describe a vapor phase product collection location which is adjacent to the feed zone.

In response to Appellant's argument, Examiner first notes that "adjacent" is commonly defined as "not distant," "nearby," and "immediately preceding or following."[2] In this regard, Jewell discloses four output lines ("product collection locations") (49) for collecting the vapor phase product from drum (19) (see Jewell, Fig. 2; and column 9, lines 17-21), with at least the right-most output line ("product collection location") (49) being nearby ("adjacent") to the feed zone (17) for input of the liquid feed oil (see Jewell, Fig. 2).

[2] *See* entry for "adjacent" *available at* http://www.merriam-webster.com/dictionary/adjacent.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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